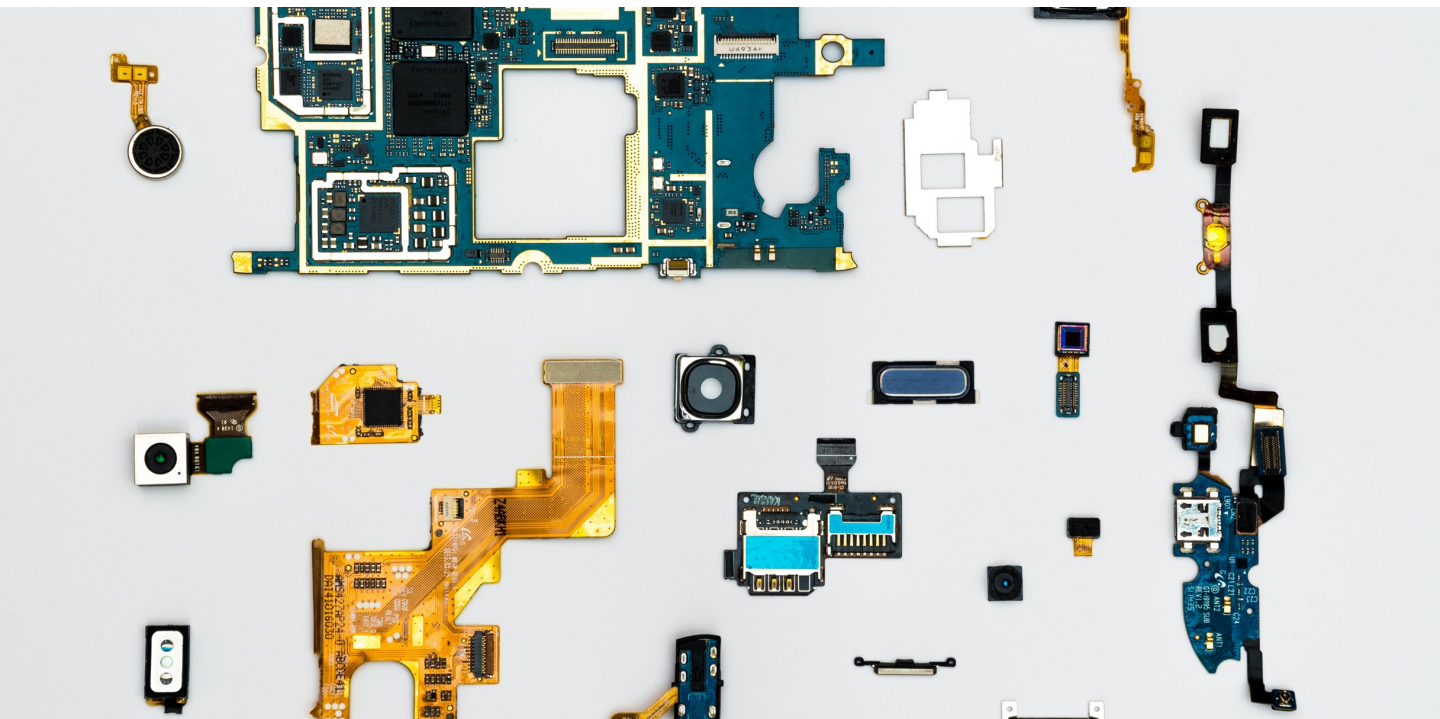# Digital Sovereignty in the New World Order:

Reforming the EU's approach to start-ups, risk, and innovation

A briefing from MCC Brussels

Dr Norman Lewis

Executive Summary

This report explores the EU's position in the digital geopolitics of the future. It focuses on one critical question: can the EU become a technological superpower by regulating digital technologies without developing them?

The EU is a regulatory superpower. Its global successes in data protection (through GDPR), which has become a *de facto* global framework for data and privacy protections, show it can flex its regulatory muscles beyond its borders. This ability to influence and dictate standards and compliance outside the EU is called the 'Brussels Effect'. It should not be underestimated. But it obscures the enduring reality that the EU is a defensive referee of digital geopolitics rather than a determining player. Despite controlling the world's largest GDP, and access to the second-largest market, only two of the world's 30 largest technology firms by market capitalisation are from the EU.

The inability of the EU to exercise *technological* sovereignty is its Achilles heel. The 'Brussels Effect', which is driven by its risk-averse precautionary culture, lulls it into a false sense of security, believing that *regulating* digital outcomes is as vital as *creating* them in the first place. This also places too much emphasis upon Brussels rather than encouraging member states to take initiatives (although Hungary's €209 million investment in a new lithium battery cell manufacturing plant in the Közép-Dunántúl region, which could spur start-ups in lithium recycling and related projects, is a welcome counter-example). In technological innovation, particularly start-ups, the EU is seriously deficient:

• Over half of global private investment into AI goes to U.S. companies.
• Only 5 of the 100 most promising AI start-ups are based in Europe.
• Private funding for AI start-ups in Europe in 2020 stood at roughly $4bn: in the US, it was $36bn, and in China, $25bn.
• Alphabet, Amazon, Apple, Facebook, and Microsoft ploughed a combined $109 billion into research and development in 2019 - roughly equal to Germany's total public and private R&D spending.

The start-up gap should be a wake-up call to the EU. The precautionary, safety-first approach of Brussels threatens the future of European innovation. AI is a relatively young and fast-evolving technology for which 'real' use cases are yet to emerge.

The exciting potential is highlighted most recently by OpenAI's Chat GPT, which, predictably, comes out of California. The 'Brussels Bureaucracy Effect' in the form of the Artificial Intelligence Act is forcing European start-ups to innovate with one hand tied behind their backs.

Many start-ups rightly see EU regulation as causing friction with significant administrative and compliance burdens on businesses. European start-ups are forced to seek money and the space to experiment outside the EU. Despite allocating €13.5 billion for start-up and scaleup support in its Horizon Europe budget for the next six years, the EU Commission doesn't have a single official in charge of start-ups. But it has many laws constraining what can be created.

Start-ups are a critical cypher for innovation health. Europe is the sick patient of the Venture Capital (VC) world:

• VC-backed exits came to a paltry $19bn in Europe in 2019, compared to $290bn in the United States.
• Half of global VC investments go to U.S. companies, one-third to Asia, and only 13 per cent to Europe.

If the EU's regulatory impulses continue to dominate its outlook, then the assertion of its digital sovereignty will only accelerate its geopolitical decline. The EU will not become a pioneer but remain a technology laggard. Referees do not win football matches. The future does not belong to the regulators of what exists. It belongs to the risk-takers who create it.

To address this, all of us across the EU need to reclaim a spirit of risk-taking, innovation and a culture of experimentation. We need to avoid demonising technological progress and foster an atmosphere conducive to start-ups, innovation and experimentation. Specifically, this report calls for the following actions:

1. Articulate and reclaim a confident and positive culture of risk-taking and innovation
2. Stop the demonisation of technological progress
3. Harmonise national tax regimes to allow start-ups to offer equity rewards to staff
4. Reform pension and endowment regulation to allow more investment in start-ups
5. Explore renewed investment incentives in companies and R&D
6. End the precautionary legal framework underpinning digital regulations
7. Roll back over-protective regulations on AI
8. Improve education, from Universities through to apprenticeship schemes, with a focus on content-rich education
9. Launch a strategic review at the EU level of member-state initiatives to promote start-ups, supporting those which expand the industrial/technological base
10. Appoint a single Innovation and Start-up EU Commissioner

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SECTION I

INTRODUCTION:

DIGITAL VS TECHNOLOGICAL SOVEREIGNTY

Digital vs Technological Sovereignty

This report aims to explore the EU's digital future. It focuses on one critical question: can the EU become a digital player on the world's stage by *regulating* these technologies without *developing* them itself? The report suggests that the EU's attempt to project itself through regulating the digital sphere obscures the scale of the challenge it faces and erects barriers that inhibit European innovation. The underlying precautionary and risk-averse culture of Brussels represents *the* biggest barrier to the realisation of its dream of digital self-determination. The report concludes that Europe's future cannot be secured through the comfortable position of *refereeing* the digital age rather than the more ambitious, risk-taking approach that would *build* it.

The report is structured as follows:

- The **introduction** focuses on the EU's orientation in the emerging sphere of data and digital geopolitics. This centres on the emergence of the vital distinction between technological and digital sovereignty. This provides the framework of the report.

- **Section II** examines the EU's technological sovereignty. It focuses on key infrastructural and technical capacities critical to exercising sovereignty today and in the future. This reveals the scale of the EU's vulnerability and the challenge it faces. It identifies the start-up innovation gap as decisive, for it has the potential to address Europe's competitive future.

- **Section III** examines the EU's digital sovereignty. This focuses on the new legislative and regulatory framework the EU has embarked upon, referred to as the 'Brussels Effect'. It concentrates on the EU's desire to control data and access to its markets and why this precautionary approach inevitably prioritises regulatory innovation rather than technological innovation.

- The **conclusion** draws out the critical implications of why the EU's regulatory innovation inevitably discourages innovation and suggests ways it could address this vital weakness.

The Rise of Digital and Technological Sovereignty

The digital transformation of 21st-century society, in which value is created and shared in ways that were inconceivable just a few decades ago, is shaping society today and in the future. Data - the digital footprint we generate through every step we take and every interaction we participate in - is the lifeblood of contemporary society. Gartner forecasted that global IT spending would exceed $4.2 trillion in 2021, significantly larger than 2019 spending of $3.8 trillion. That is set to grow to $16 trillion by 2030.[1] According to the German research portal for global market data, Statista, the amount of data created, captured, copied, and consumed worldwide is expected to grow from around 59 zettabytes (ZB) in 2020 to about 149 ZB in 2024.[2] That's the equivalent of 149 trillion 1GB USB data sticks. Whoever controls this data and can use it to generate new research, breakthrough products, and services stands to shape the future.

Can the EU become a world leader by regulating digital technologies without developing them itself?

It is, thus, not surprising that data and digital geopolitics have become a global preoccupation, particularly for the USA, China and the EU. These governments and institutions are increasingly intervening to further their digital capacities and protect domestic markets and capabilities. This is even apparent in the USA, where federal lawmakers have always had a hands-off approach to regulating markets. According to Stanford University's 2022 Artificial Intelligence Index Report, while just one federal bill on AI was proposed in 2015, this had risen to 130 in 2021.[3] Not surprisingly, China's 2021 Five Year plan has strengthened controls over strategic sectors, including technology and healthcare, with new legislation and a regulatory environment which has stunned investors.[4] As early as 2015, Russia enacted its Data Sovereignty law, stipulating that all data generated in Russia must be stored there.[5]

The EU has certainly not been immune. Since the election of Ursula von der Leyen

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as President of the Europe Commission in 2019, digital geopolitics and digital sovereignty have emerged as top priorities for the EU. Europe's digital transformation was already a priority before the Covid-19 pandemic. In fact, 'Making Europe fit for the digital age' ranked third among the European Commission's list of objectives for 2019-2024,[6] a prioritisation evidenced by a raft of legislative initiatives on artificial intelligence, data, and market access, all published just a month before European lockdowns began. However, the impact of the pandemic, particularly the importance of using personal health data and supply chain vulnerabilities, reinforced the importance of digital policymaking and, thus, strengthened the EU's resolve to implement its digital strategy, outlined in 2020.[7]

> ### Despite their importance, there has been little attempt to define precisely what technological and digital sovereignty mean.

For the EU, the key to the future lies in building what Thierry Breton, Commissioner for Internal Markets, terms Europe's 'technological sovereignty'. He spelt this out in his election manifesto for his current post:

'Europe cannot make its digital and green transition happen without establishing technological sovereignty. This is not a protectionist concept, it is simply about having European technological alternatives in vital areas where we are currently dependant. We need to work together at European level in areas of strategic importance such as defence, space, and key technologies such as 5G and quantum….To implement this vision of turning Europe into a digital, technological and industrial leader, with an integrated Single Market at its basis, I will define clear objectives for each priority that can be assessed over the course of the mandate.'[8]

Despite the centrality of this in Breton and the EU's subsequent digital initiatives, there has been little attempt to define precisely what technological and digital sovereignty mean. Very often, the terms are used interchangeably, suggesting they refer broadly to the same thing. But the distinction between them is critical. Both represent different dimensions of the building blocks of digital transformation and, thus, in terms of this discussion, the constitution of the capacity to exercise sovereignty in practice, not simply rhetorically.

> ### It is critical to distinguish technological and digital sovereignty – foundations and regulations require different approaches.

In almost all the EU's deliberations on digital strategy, technological issues and digital outcomes are lumped together. For Thierry Breton, for example, the foundation of Europe's sovereignty for the next twenty years rests upon three inseparable pillars: 'computing power, control over our data and secure connectivity'.[9] In a paper titled 'Safeguarding European values with digital sovereignty: an analysis of statements and policies', published in the journal Internet Policy Review in September 2021, the authors reveal that in 2020/21, 'digital sovereignty' appeared on at least 180 web pages from the European Commission's Councils and Parliamentary official websites.[10]

Their analysis showed that what preoccupies Brussels in its debate about achieving digital sovereignty are five key themes: data governance, constraining platform power, digital infrastructures, emerging technologies, and cybersecurity. These shopping lists of technological capacities and regulatory frameworks are not helpful because they provide no clarity as to any order of prioritisation: what comes first, for example, regulating outcomes or prioritising the foundations of Europe's technical vulnerabilities and incapacities which requires a very different strategy from regulation?

Of course, these spheres are interlinked with overlapping dependencies. But to establish what these are, rank their importance and degree of difficulty as part of executing a digital strategy, it is critical to distinguish one from the other. Only through this is it possible to establish the scale of the challenge the EU faces. This also enables us to identify the gaps in the strategy and test and assess the EU's quest to take its place in the digital geopolitical order of the future.

Digital vs Technological Sovereignty

Technological vs Digital Sovereignty: What's at Stake?

The differences between these two terms can be understood as follows:

- **Technological sovereignty** is a foundational concept. This relates to the structural foundations upon which the digital realm rests. This includes network infrastructures (fibre-optic backbones, mobile [including satellites] and fixed and 5G communication networks, data storage and cloud computing); innovation capacities (investment in Research & Development, VC funding environments, start-up ecosystems, education and skill bases); security (military and cyber) and computing power (quantum computing and hardware and software manufacturing and capacities). In short, these are the technological foundations of the digital economy upon which competitive capacities rest.

- **Digital sovereignty** relates to the capacity and authority to control the outcomes of digitisation. It is a dependent, not independent, variable. It is an outcome-based concept rooted in the technological foundations of a particular nation or entity. This relates more to the regulatory and policy elements arising from digitisation: how data should be stored and protected; whether this is transmissible across borders with all the ramifications for privacy and citizen's rights; competition, and open access to markets to prevent monopolistic practices; how these assets should be taxed at home and abroad etc. In short, this sphere deals with influencing the legal and behavioural frameworks governing the outcomes of digital consumption and interactions.

The distinctions between these concepts have critical ramifications for this discussion. Conflating the two obscures the reality that technological sovereignty is the foundation upon which digital sovereignty rests and can only rest. There is a dependency here which necessarily forms a key component of the ability to exercise sovereignty in practice.

But there is an equally important dimension of these technical issues; namely, that each sphere represents a different mindset which is often contradictory. Technological sovereignty, while rooted in the present, is forward-looking. Building this capacity requires entrepreneurship and risk-taking, a willingness to tolerate failure and belief in the ambition to shape the future. Digital sovereignty is necessarily stuck in the present, which assumes this to be coterminous with the future. It seeks to influence outcomes and, critically, the behaviours built on the existing technologies that shape day-to-day life, not future ones. Regulation, after all, can only be applied to what exists, not to what might be invented in the future. Strictures placed upon what exists today can easily constrain technological progress tomorrow and thus serve to inhibit innovation.

> **Technological sovereignty is the only foundation upon which digital sovereignty can rest.**

These distinctions allow us to establish the strengths and weaknesses of the EU's position. They also enable us to set out the scale of the challenges facing the EU, and, thereby, suggest what order of priority ought to be given to the different components of its digital strategy.

The 'Brussels Effect' and the Start-up Gap

Today, the EU sees itself as a regulatory superpower. Its relative global successes in terms of imposing its standards beyond its borders in the field of data protection (through GDPR) reveals that the EU does have the power through which to assert its digital sovereignty. This is what is referred to as the 'Brussels Effect'[11] - the EU's ability to influence standards and compliance beyond its borders. While this shows that regulation has now become a major field of geopolitical confrontation, it is a very precarious basis upon which to face the future. Why? Because the EU's assertion of its digital sovereignty rests more on its ability to control access to the world's second-largest market rather than on the strength of its own digital capacities. Remarkably, despite boasting the world's largest GDP, it has failed to produce any truly noteworthy, world-beating homegrown technology giants. Only two of the world's 30 largest technology firms by market capitalization are from the EU.[12]

Box I: Digital standards and geopolitics

The arcane world of global technology standards and the alphabet soup of acronyms that accompany this might appear impenetrable and boring, but it is an expression of global technological power.

Historically, the United States' approach to standards-setting, reflecting its technological dominance, has been decentralized, characterized by a preference for industry-led and multi-stakeholder participation. Due to the strength of the U.S. innovation ecosystem and widespread adoption of American technologies globally, American engineers and developers have led multi-stakeholder internet-related Standards Development Organisations like the World Wide Web Consortium (W3C) and Internet Engineering Task Force (IETF). The USA has a lead in participation in the IETF by the per centage of attendees (51.64 per cent) followed by the EU (20.10 per cent) and China (6.64 per cent). American engineers also contribute the greatest number of proposals (69.86 per cent) followed by China (16.71 per cent).[15]

But this is changing. The EU is certainly increasing its focus on this sphere. It published a new Standardisation Strategy earlier this year, which focuses on how Europe can set global standards in support of enabling 'a resilient, green and digital single market'.[16] China has had a conscious strategy of increasing its presence in all standards-setting bodies.[17] Their marked presence in the International Telecommunications Union (ITU) - the UN body that sets global telco interoperability standards - attests to their ambitions. Although they have been very much at the forefront of pushing the ITU to set standards for the internet, this has so far not been realised. However, it is a microcosm of the digital power struggle taking place today.[18]

The 'Brussels Effect' is a negative rather than a positive assertion of power. Two things underpin its ability to project power: access to the single market and robust regulatory institutions. The legal frameworks backed by myriads of policymakers and bureaucrats that can transform market access into tangible policy are the ace up the EU's sleeve. China does not have the sophistication of the EU bureaucracy, while the USA certainly has but has so far systematically refused to intervene in its market. This reluctance has enabled the EU to fill the gap. But for how much longer remains an open question.

Basking in the impact of the 'Brussels Effect' is a precarious position. The reason why there is no discussion about the 'Washington Effect' or the 'Beijing Effect' is that these powers do not rely on their size to assert their technological sovereignty. They do it through the technological dominance of their industry and corporations, through technical standards bodies which become the world's de facto standards by default. This is where digital power truly resides. And in this, the EU is conspicuously wanting. (See Box I)

The 'Brussels Effect' lulls Europe into a false sense of security because it obscures the massive gaps in its own technological capacities. This underestimates the scale of the challenge it faces in the future. This also places too much emphasis on Brussels rather than encouraging member states to take the initiative. A good example is the Hungarian government's €209 million investment in a new lithium battery cell manufacturing plant in the Közép-Dunántúl region.[13] Not only would this build some European capacity in a vital technology for the future, but it could also spurn vibrant start-ups in lithium recycling and related projects - start-ups that could have a European-wide, indeed, global significance.

This report aims to highlight some of those gaps. It focuses on what we term 'the start-up gap'. This is a critical weakness in the EU's digital strategy. Underpinning it are not just economic weaknesses but cultural and political attitudes that are preventing the EU from implementing meaningful change.

Digital vs Technological Sovereignty

Start-ups are important, not only in the digital sphere but in technological infrastructure too. The entrepreneurship and drive they represent are some of the key vectors of technological progress and thus act as an indicator of the potential for future capacity. Still, they do not magically appear from nowhere. Nor can they be summonsed into being in Brussels commission meeting rooms, nor through the publication of white papers or Innovation Agendas.[14] It is not possible to specify, let alone regulate, unexpected outcomes.

> **The 'Brussels Effect' lulls Europe into a false sense of security because it obscures the massive gaps in its own technological capacities.**

As we will see, the EU's start-up gap is an area where the EU is seriously lagging its competitors. Addressing it is urgent and, most importantly, achievable. Europe has a large reservoir of talent and technical skills. The fact that so much of this has been lost because European entrepreneurs find it easier to realise their ambitions abroad is an indictment of the EU's digital practices. As the report concludes, Europe requires some fundamental rethinking of these practices and a reorientation of its digital priorities.

SECTION II

MIND THE GAP:

THE EU'S TECHNOLOGY SOVEREIGNTY SCORECARD

Technology Sovereignty Scorecard

The capacity for the EU to practice technological (and thus digital) self-determination rests upon its ability to control the data, infrastructure, hardware and software that are created and relied upon to operate in its territory. The control of data straddles technological and digital sovereignty. Data sovereignty - a subset of digital sovereignty - relates to data being subject to the laws and governance structures within a territory where it is collected or pertains. Today, on-premises data infrastructures are increasingly being displaced by cloud-based computing and storage. Control over cloud computing and the infrastructure this rests upon – the pipes, the location of data centres, processing, and application development – is, therefore, fundamental. The same can be said for hardware and software: whoever is able to dominate these spheres exercises de facto control over the standards and applications that everyone must abide by to participate in the digital world.

When we examine some of these dimensions, it becomes clear that the EU has some strengths, but many weaknesses. We begin with the key infrastructures upon which cloud computing and data storage are increasingly dependent.

Infrastructure: the internet backbone

One of the most significant changes over the past decade in the global infrastructure of the digital world has been the shift towards the privatisation of the ownership of the Internet backbone itself. This point was made by the Wall Street Journal as far back as 2013,[19] when they noted how the four US tech giants, Google parent Alphabet, Amazon, Facebook (now Meta) and Microsoft were on a quest to control the internet's cable infrastructure.

Fibre-optic cables now carry 95 per cent of the world's international internet traffic.[20] This links up most of the world's data centres, the vast server warehouses where the computing happens that transforms all those 1s and 0s into the digital experiences of the 21st century.

In less than a decade, these four companies have become dominant in undersea-cable capacity. Before 2012, their share of the world's undersea fibre-optic capacity was less than 10 per cent. Today, that figure is about 66 per cent.[21] In the next three years, they are on track to become the primary financiers and owners of the web of undersea internet cables connecting the richest and most bandwidth-hungry countries on the shores of both the Atlantic and the Pacific. By 2024, they will have an ownership stake in more than 30 long-distance undersea cables. In 2010, these companies had an ownership stake in only one such cable—the Unity cable, partly owned by Google, connecting Japan and the USA.[22]

According to the telecommunications market research firm TeleGeography's 2021 annual report on submarine cable infrastructure, these actions increased capacity by 41 per cent in 2020 alone.[23] This is significant, even more so is how the balance of power has shifted towards the Big Tech companies.

> **In the field of technological sovereignty, the EU has many weaknesses, especially in cloud and data storage.**

In the past, trans-oceanic cable laying required the resources of governments and their national telecom companies. But these costs are small change for today's titans: in 2020 alone, Microsoft, Alphabet, Meta and Amazon together poured more than $90 billion into capital expenditures. Big Tech is playing the role that was historically filled by incumbent national Telcos. When Google started this trend in 2008, with its $300 million investment in the cable system connecting California and Japan, it did so by entering into an agreement with the U.S. Department of Homeland Security. That agreement set conditions between the government and the company designed to protect US national security.[24] While many of the Big Tech-funded cables are collaborations among rivals,[25] some of the Big Tech companies are sole owners of undersea cables: Google already has three and is projected by TeleGeography to reach six by 2023.[26] Google is now engaged in a project linking India to Europe, which will also help Google roll out data centres globally and catch up to its rivals Microsoft and Amazon in the highly competitive business of on-demand cloud computing.[27]

The growing power of these Big Tech companies and their closer integration with

Technology Sovereignty Scorecard

the US government is an important development for the future of digital geopolitics. Leaving aside the military and security implications, the ability of these companies to vertically integrate all the way down to the level of the physical infrastructure of the internet itself gives them an enduring edge in digital markets: it reduces the costs for delivering search results, social networking services and, critically, cloud computing services. Their control of the pipes also allows them enormous flexibility to locate their data centres closer to the customers and to reduce their energy costs. As servers become more powerful, more kilowatts are needed to run and cool them. Data centres worldwide now consume more energy annually than Sweden.[28] About 2 per cent of the total energy in the US is used by data centres and 40 per cent of data centre operating costs come from energy consumption.[29]

Big tech now has the ability to control much of the internet architecture – like a car manufacturer owning the roads.

Clearly, this increased capacity gives these companies a competitive edge. Global shortages of fibre optic cable now threaten digital growth with rising prices, casting a dark shadow over 5G rollouts and the development of data centres. Europe, India and China are among the regions most affected by the crunch, with prices for fibre rising by up to 70 per cent from record lows in March 2021.[30]

Controlling the fibre-optic cables is the equivalent of owning the motorway. Imagine the implications if Amazon owned the roads on which it delivers packages. It is the foundation of the digital world; not having an influence on its running suggests a worrying vulnerability. Because Big Tech are not regarded as Telcos, they are not governed by 'common carrier' legislation. Unlike Telcos, they could restrict access to their pipes, or prioritise their traffic versus their competitors'. But this is only part of the problem. By controlling the internet backbone, significant advantages are gained because this infrastructure is the foundation upon which Big Data and cloud computing rests - the engines of the future digital system, particularly Artificial Intelligence-based innovation.

Data Localisation and Cloud Computing

Data centres are physical locations that house the hardware and infrastructure necessary to store and transmit data over a network. In-house data centres have increasingly given way to remote data centres, and now, with the rise of cloud computing, to cloud-based centres. The cloud should be understood as a computing environment located in a remote location with multiple backups scattered in other locations to provide redundancy. For example, Microsoft Office 365 is a cloud application. Its data are hosted on servers all around the world, and those servers are located in data centres. Likewise, Google's own office suite (along with other additional cloud applications for both consumers and businesses) is run and stores data on Google servers in Google data centres.

According to data collected by the Synergy Research Group, four companies own 67 per cent of the world's $130 billion cloud market. Leading the pack by a large margin is Amazon Web Services, which enjoys a 32 per cent market share, followed by Microsoft Azure with 20 per cent. Together they make up 52 per cent of the market. With Google Cloud at 9 per cent and Alibaba Cloud at 6 per cent, these four companies own over half of the market. IBM Cloud, Salesforce, Tencent Cloud, and Oracle Cloud combined makeup 12 per cent.[31]

The Asia & Pacific region is home to the most cloud data centres (95). The United States and Canada region is not far behind (79). Together these regions account for 72 per cent of the world's cloud data centres, with Europe housing 24 per cent and Latin America just 4 per cent. The United States and China are ranked first and second in terms of the total number of availability zones, with 69 and 31, respectively.[32]

Europe houses just 24% of the world's cloud data centres.

According to Statista, the number of remote data centres worldwide in 2022 by country show that the EU has 1,299 compared to the USA's 2,701. China stands at 443, slightly below Germany with 487.[33] The location of data centres is bifurcating along the digital geopolitical divide.

For example, Chinese internet conglomerate Tencent Holdings, which operates 20 data

Technology Sovereignty Scorecard

centres outside China, is now aiming to add 30 to 50 per cent more data centres mostly in Indonesia, South Korea, Thailand and the Middle East.[34]

So far, the EU's attempts to create data centre alternatives have failed to produce any results.

These data centres are the infrastructure upon which cloud computing rest. Cloud computing offers better security, cost efficiencies, and the ability to build AI applications with the most advanced technologies, such as machine learning, Internet of Things (IoT), and next-generation databases, more easily. As mentioned above it reduces energy costs. 451 Research, an S&P Global Market Intelligence company, found that European businesses could reduce energy usage by nearly 80 per cent if they ran applications on Amazon's cloud as opposed to their own data centres.[35] It is estimated that at least 75 per cent of companies will take up AI, cloud and big data technologies by 2030. An International Data Corporation (IDC) white paper commissioned by Amazon, 'Trusted Cloud: Overcoming the Tension Between Data Sovereignty and Accelerated Digital Transformation', found that 40 per cent of revenues reported by large European organizations will be accounted for by digital technology by 2025.[36]

This represents a huge challenge to the EU. So far, its attempts to create alternative cloud computing and storage facilities have failed to produce any results (see Box II on the stalled GAIA-X initiative). Moreover, Big Tech's capabilities mean it has developed the flexibility to cope with the EU's regulatory environment, which is aimed at diminishing its power. For example, Amazon is collaborating with Salesforce to provide organizations with more choices of where to locate encryption keys to meet European government data jurisdiction needs. It is also has established 'Local Zones' in Amsterdam and Brussels to enable organizations greater ability to build applications with even lower latency while retaining data residency. While Brussels is intent on curbing Big Tech, member states like Holland are rolling out the red carpet to attract Big Tech data centres to their territory. Big tax breaks and access to subsidised energy contracts and agricultural

land are facilitating the building of hyper-scale data centres across Europe by Google, Facebook, Microsoft, Apple and Amazon.[37]

The tension between member states and Brussels is not a side issue. An IDC survey on digital sovereignty reveals that, unlike Brussels, only 16 per cent of European respondents were concerned about the nationality of their cloud provider, although differences do exist by industry sector. Moreover, 60 per cent of European organizations agree or strongly agree that digital and data sovereignty increases the cost of doing business internationally. The IDC Enterprise Resilience Survey in September 2021 predicts that over the next four years, 50 per cent of European organizations will spend 10 per cent of their ICT budget to comply with digital sovereignty principles adopted in the EU. The extra spend is expected to cover additional costs and time on infrastructure, data, processes, governance framework, and skills.[42] The costs to start-ups are even more profound and represent a significant barrier to their future evolution. This will be examined in more detail below.

60 per cent of European organizations agree or strongly agree that digital and data sovereignty increases the cost of doing business.

If we now turn to the critical area of AI and the future of innovation in Europe, it will become clear why regulatory innovation is perhaps the only area in which Brussels can truly make an impact.

AI and Innovation

In 2021, the non-profit, nonpartisan Information Technology and Innovation Foundation (ITIF),[43] Centre for Data Innovation, posed a simple but important question about why the EU, an economic superpower boasting the world's largest GDP, had failed to produce any homegrown technology giants of note. It went further and asked why Europe is not at the forefront of the AI revolution.[44]

These questions are very pertinent. The EU is in an extremely weak position vis-a-vis its

Box II. The failure of 'data sovereignty by design': the case of GAIA-X

In 2019, the German and French governments set up a project set out to connect European cloud providers to localise data storage and usage, making it easy for businesses and customers to move industrial data around freely within the network[38]. GAIA-X was an attempt, in the words of German Economy Minister Peter Altmaier, for Europeans to 'assert ourselves in the world.' But a mere sixteen months later, GAIA-X has become a cautionary tale.[39] GAIA-X has shown just how difficult it is to give real meaning to the aspiration that 'European values' on data protection, cybersecurity and data processing should be respected.

The alliance was established as a non-profit and in less than a year in 2021, had elected a new board and attracted over 320 member organizations. But reality soon curbed enthusiasm when it became clear that to build viable European cloud data sovereignty, input from the incumbent and dominant cloud service providers was necessary. The alliance took in non-European firms, including Microsoft, Google, Amazon, Palantir, Huawei, and Alibaba, as full members. Their deep commercial ties with Europe's telecoms giants and their critical input into the technical committees stalled progress on the key issue of enabling European data to stay in Europe or not. The project stalled in its aim to move Europe away from U.S. giants. This failure prompted the EU to form an industrial alliance to take on this task but failed to get much buy-in from European companies. The Commission launched its Important Project of Common European Interest (IPCEI) for cloud services, an industrial policy funding scheme that would allow governments to pour subsidies into the sector.[40] A group of European software and hardware firms launched an association called Euclidia, 'for Europe to become a global leader without following the American or Asian models' in 'cutting edge cloud technology.'[41] These are yet to deliver anything real.

competitors in the digital sphere. (See Box III). Even though Europe has 20 per cent more software engineers than the USA, boasts world-leading universities,[45] and has advanced quantum computing expertise, it has so far failed to produce any outcomes to match the USA and China. Over half of global private investment into AI goes to U.S. companies.[46] Only 5 of the 100 most promising AI start-ups are based in Europe.[47] Deutsche Bank Research notes that private funding for AI start-ups in Europe in 2020 stood at roughly $4bn and was dwarfed by the US at $36bn and China at $25bn. The Information Technology & Innovation Foundation notes that the EU is falling behind and ceding the playing field to the United States and China.[48] Stanford University's Artificial Intelligence Index backs this up reporting that the EU is losing the AI race to the U.S. and China.[49] Swedish MEP Jörgen Warborn, warned during a parliamentary hearing that the EU is 'severely behind when it comes to private-sector AI investment'.[50] This will be examined in more detail in the following section.

The investment shortfall in AI should be

particularly worrying for the EU. To innovate in this space requires resources. It is expensive to create and maintain digital space, particularly AI on a massive scale. Alphabet, Amazon, Apple, Facebook, and Microsoft ploughed a combined $109 billion into research and development in 2019. That is roughly equal to Germany's total public and private R & D spending in the same period, and, by way of comparison, more than double the amount spent by the United Kingdom's government and private sector put together.[51] In reality, the EU is not in the race when it comes to AI. It is rarely cited as even participating.

The AI investment shortfall represents a significant weakness in the EU's pretension to assert its technological and digital self-determination. The ambition for the EU to lead the world in what it calls 'Ethical AI', expresses this clearly.[59]

Ethical AI is a self-conscious attempt to distinguish the EU from the USA and China. The goal of becoming 'the world-leading region for developing and deploying cutting-edge, ethical and secure AI' is an attempt to secure some space for Europe's struggling

Box III. Big Tech vs the EU

The power of Big Tech today is immense. A few examples reveal the scale of their dominance, which until a decade ago, would have seemed incomprehensible.

- **The World Economic Forum shows that in 2020/1, the total EU government R&D spend was $109bn.[52] The top seven Big Tech companies globally spent $167.5bn.[53]**

- **In 2021, only one EU corporation was in the top 11 global corporations in terms of R&D spending** - Volkswagen of Germany, a car manufacturer rather than a Big Tech giant. Eight of the top 11 were Big Tech companies: six from the US (Amazon, Alphabet, Microsoft, Apple, Facebook and Intel), one was Chinese (Huawei), and one South Korean (Samsung). The remainder were pharmaceuticals: Roche Holdings based in Basle, Switzerland and Johnson and Johnson from the USA.[54]

- Before the current economic slowdown and techlash, **the combined market capitalisation of the top seven Big Tech companies**, Facebook, Amazon, Alphabet (Google), Tesla, Microsoft, Apple and Netscape, stood at over $8 trillion. That's about **equivalent to Germany, France and Spain's GDP combined**.[55]

- **In 2021, the cash reserves of tech giants** Microsoft ($136.6bn); Alphabet ($121.2bn); Apple ($100.6bn); Facebook ($52.3bn) and Amazon ($43.7bn) totalled $454bn. This enables enormous flexibility and power, particularly to purchase promising or threatening start-ups. One of the best examples is how Google was able to outbid Facebook and acquire the most promising AI start-up in the world at the time, UK-based DeepMind for $660m in 2014.[56]

- According to a report by the Centre for Data Innovation which examined **six metrics** – talent, research, development, adoption, data, and hardware – **the US still leads in absolute terms**. China is in second place, with the EU behind both.[57]

Technology Sovereignty Scorecard

AI sector, mainly through the assertion of its regulatory muscle, which we will examine in more detail below. The strategy is not just to set standards in the name of European citizens' rights, but to influence foreign actors to follow the European lead. More in hope than reality, the EU believes this could become a competitive advantage for European businesses in the global marketplace. European firms following ethical AI rules will apparently be at an advantage.[60]

AI investment shortfall is a big weakness in the EU's pretension to assert itself in digital technology.

The fatal flaw is that in choosing to make Ethical AI and the European single market a battleground for the future, the EU is effectively going into battle with one hand tied behind its back. Once Europe becomes a battleground, the outcome will be determined by the two superpowers, America and China, not the EU. Being a battleground between two superpowers does not represent the assertion of the EU's sovereignty, but an expression of its opposite.

We have already noted how in the sphere of AI start-ups, Europe seriously lags behind the USA and China. This gap is not confined to AI.

The Start-up and Innovation Gap

Start-ups are a very important, but neglected dimension, of the EU's digital strategy. They are the bridge between the discovery and development of disruptive technologies to their everyday use by the public. Through start-ups, entrepreneurs bridge the gap between research, invention, and the dissemination of technologies into society. In the process of pursuing practical outcomes, an eco-system, which includes the investment environment and the building of the skills required, evolves over time. While government policy and support can aid this outcome, it cannot be decreed from above. It is an organic process rooted in a risk-taking culture which is comfortable with failure, has an entrepreneurial spirit and is future-facing.

Nobody foresaw that Google, Microsoft or Amazon, would become the Big Tech companies that dominate global markets when they emerged as start-ups. They were organic outcomes of a pre-existing cultural and economic system. The idea that disruption could be legislated in advance - a sentiment that flows through every EU discussion on innovation - reads history backwards and seriously underestimates what it takes to build the capacity to bring this about. You cannot specify, let alone regulate, unexpected outcomes.

One statistic sums up how much is lacking in the EU start-up innovation space. Far fewer European technology start-ups go public or are acquired: Venture Capital-backed exits came to a paltry $19 bn[61] in Europe in 2019, compared to $290bn in the United States.[62] According to a report authored by Copenhagen Economics for the EU Commission, in the non-listed capital market, which includes angel investors, venture capital and private equity, European companies have access to merely a quarter of the equity investment capital that U.S. companies have when adjusted for gross domestic product. The study concluded that the lack of funding for seed and start-up companies means fewer companies survive the later stages in the business life cycle and thereby meet their growth potential.[63]

EU start-ups are limited by venture capital, regulation, and the ability to 'exit'.

The European Venture Capital sector seriously lags behind the US model.[64] European investment in VC funding is limited by law. Pension and endowment funds are limited to paying only 0.3 per cent fees, compared to 2 per cent in the USA. Profit sharing is also capped, which is another disincentive to VC funding. Deregulating this across Europe would address the early-stage private investment in start-ups - a gap that seriously impacts European start-ups. As a result, fast-growing start-ups are mostly dependent on American and Asian investors. *Venture Monitor* noted in 2020 that while venture capital investment in the US economy stood at around $150bn, it was over three times less at $40bn in the EU.[65] Silicon Valley-based *TechCrunch* notes that half of global VC investments go to U.S. companies, one-third to Asia, and only 13 per cent to Europe,[66] while *Politico* observes that on a

Technology Sovereignty Scorecard

per-capita basis, venture capital investments are almost seven times higher in the United States compared to France and Germany.[67]

The risk-averse mood and the regulatory strictures in Europe mean that start-ups are forced to seek funding abroad.

It is, thus, no surprise that numerous European entrepreneurs have been forced to raise money and locate themselves in the US to become successful.[68] According to Olivier Huez, a serial French entrepreneur and now a partner at VC firm Red River West, French start-ups that have a US presence see their web traffic grow 50 per cent faster than those who don't, and they raise 2.3x more capital.[69] And as we will discuss in the next section, the strictures the EU is placing on AI innovation means European AI start-ups are very likely to seek territories where they will be freer to innovate rather than be shackled by strict regulations.[70] One in three start-up founders in Europe considered starting their business elsewhere due to the scale of the regulatory and compliance burden in Europe.[71] We have also seen in Box III how it is American Big Tech companies, who are willing to take the risks their European counterparts fear, that sweep up Europe's most promising start-ups like DeepMind.

The risk-averse nature of the European VC environment, together with the regulatory strictures in Europe and the reality that start-ups are forced to seek funding abroad, makes the development of a European start-up ecosystem extremely difficult. The network effect of a start-up ecosystem cannot be underestimated. Silicon Valley, for example, has a vibrant culture of mentoring, networking and generally providing a collaborative and competitive environment which creates an open entrepreneurial culture. In Europe, pockets exist in numerous capitals, but they cannot compete with Silicon Valley. Moreover, many European start-ups see EU regulation as causing unnecessary friction and placing significant administrative and compliance burdens on businesses. Fifty-three per cent of start-up respondents to a survey cited the time spent on this as the biggest threat to their business.[72]

The approach of Brussels to the start-up issue is characterised by bureaucracy, a lack of focus, incompetence and ignorance. The EU's primary body for start-up financing, the European Innovation Council (EIC), launched under the Horizon Europe programme with the promise of over €10 bn,[73] has been dogged by bureaucracy and departmental in-fighting about who should have the power to disburse funds. Last year, the Commission transferred the management of the EIC to the European Investment Bank (EIB). While this was initially met with some resistance from member states, it was finalised in February.[74] But the money has not been forthcoming. As a result, the beleaguered organisation is now the subject of a parliamentary investigation launched last month by conservative MEP Christian Ehler.[75]

The scandal over the EIC demonstrates the stultifying top-down bureaucratic political culture that informs its practice. Passing resolutions and publishing white papers - areas of remarkable EU proficiency - does not equate to creating an innovation ecosystem that is willing to take risks and boost the potential for disruptive innovation. Given how far the EU lags its rivals and given how critical this is to its future, one would have imagined the EU would have declared an innovation state of emergency and acted accordingly.

The approach of Brussels is characterised by bureaucracy, lack of focus, incompetence and ignorance.

Despite allocating €13.5 billion for start-up and scaleup support in its Horizon Europe budget for the next six years, the EU Commission doesn't have a single official in charge of start-ups. Responsibility appears to be divided between Thierry Breton and the Commissioner of Innovation, Mariya Gabriel, who often appear to be acting independently of each other. Gabriel, whose job title suggests she ought to have overall control over start-up initiatives, instead must rely upon the goodwill of many fellow Commissioners whose remits encroach on start-up affairs.

Areas critical to the development of a robust start-up culture and eco-system reside in departments other than Innovation. Thierry

Technology Sovereignty Scorecard

Breton and competition czar Margrethe Vestager lead the EU's efforts to tame Big Tech in the form of the Digital Markets Act and the Digital Services Act. The 25-point action plan for a start-up ecosystem rests across several different commissioners whose portfolios land within the agenda's scope. For example, the EU's listing act, which will smooth start-up companies' paths to the stock exchange through a simplification of requirements, is in the hands of Financial Services Commissioner Mairead McGuinness. Cohesion Commissioner Elisa Ferreira is focused on closing the West-East investment gap and regional innovation, while talent, reskilling and upskilling reside with Jobs and Social Rights Commissioner Nicolas Schmit.

With this level of bureaucracy, it is no wonder that European start-ups have been critical of the absence of a single point of contact.[76] The riposte by the Commission that they regard supporting start-ups as a priority for the Commission as a whole means that in practice, it is not a priority.

Equity rewards are key to attracting staff to start-ups. But many member-states make this difficult, and the EU doesn't seem to care.

There also appears to be no urgency in addressing these bottlenecks. Take the important question of hiring talent.[77] Fuelled by a lack of skilled tech professionals, start-ups struggle to compete with bigger, more established corporations to attract the talent they need. In the USA, equity for key talent is the proven route to the attraction and retention of vital personnel. But because of the unfavourable tax treatment of stock options in some EU member countries, this route is a non-starter. As taxation is a national competence, the EU Commission's hands are tied, and thus, many European start-ups are unable to offer equity to incentivise recruitment. The EU is to set up a 'working group' of EU member countries in 2023 to examine the equity issue. Remarkably, this is the first time the EU is addressing this question. If this is what the EU Commission means by supporting start-ups, one cannot but be sceptical about their future.

The inert, disorganised approach of the EU

to start-ups is illuminating. It suggests that it either does not truly understand the start-up world and the role they play in developing an innovation pipeline, or they do not take innovation that seriously. The present Commissioner for Innovation, Mariya Gabriel, has no experience with either start-ups or corporate innovation. This lack of experience seems to run through the entire Commission. But perhaps the real reason for this lackadaisical stance is that they truly believe that the assertion of their regulatory power rather than real innovation represents the key to building Europe's digital self-determination.

Amazingly, the present Commissioner for Innovation has no experience with either start-ups or corporate innovation.

Yet, the above analysis reveals how far behind Europe is in key areas that constitute the grounds for technological sovereignty. What seems to be happening is that the EU believe that its regulatory power in the sphere of digital sovereignty can act as a counterweight to this technological imbalance. As we will now go on to explore, the EU's regulatory approach - the 'Brussels Effect' - is a high-risk strategy that not only obscures the weak technological foundation upon which it rests, but also hides from view the urgent task of developing a European innovation capacity that can help shape the future.

SECTION III

REGULATORY INNOVATION AND THE 'BRUSSELS EFFECT'

The Brussels Effect

We noted in the introduction how the EU rightly regards itself as a regulatory superpower.

Its relative global successes in terms of imposing its standards beyond its borders in the field of data protection through the General Data Protection Regulation (GDPR)[78] opened a new chapter in internet history[79] and became the most contested and successful law in the EU's history. The success of GDPR certainly reveals that the EU does have the power through which to assert its digital sovereignty. This is the 'Brussels Effect'[80]- the EU's ability to influence standards and compliance beyond its borders and the power to fine any company in breach of these rules operating in Europe by as much as four per cent of its total worldwide sales.

The EU tries to *control* outcomes not *create* new ones – it avoids difficult decisions necessary to address technological weakness.

However, our analysis shows that this is a very precarious basis upon which to face the future. The EU's assertion of its digital sovereignty rests more on its ability to control access to the world's second-largest market rather than on the strength of its own digital capacities. The 'Brussels Effect' is a castle built on sand. It is more an expression of weakness rather than strength. It is a negative rather than a positive assertion of power.

As mentioned in the introduction, the 'Brussels Effect' is both limited to digital sovereignty and takes the focus away from the need to boost technological sovereignty. In addition, by placing all the emphasis on Brussels, it takes the critical focus away from encouraging member states to take the initiative.

Given the political cultural outlook of Brussels, the EU does not really have any alternative. Buoyed by the precautionary risk-averse mentality of Brussels[81] and Europe's corporate and financial institutions, and given its weak technological capacities, the EU seeks to control outcomes rather than determine new ones. This might yield results in the short term, but it avoids the difficult and hard decisions it needs to make to address its technological weaknesses.

In overly focusing on influencing existing behaviours, the EU is in danger of erecting a legal digital monolith that could inhibit future European innovation. The regulatory enactments in the Digital Data, Markets, AI, and Services Acts aim to give the European Commission new powers to fine Internet platforms over illegal content, control high-risk AI applications, and potentially break up technology companies that EU bureaucrats deem too powerful. But many of these changes will also inhibit rather than liberate European entrepreneurs and start-ups and prevent ecosystems to emerge that are vital for the future. The 'Brussels Effect' today will be tomorrow's 'Brussels Bureaucracy Effect' with dire consequences for Europe's start-up culture.

Regulatory Innovation and Unexpected Outcomes

Given the importance of AI to the digital future, it is useful to examine parts of the EU's proposed Artificial Intelligence Act (AIA).[82] The machines of the future are learning that whatever else they might discover, the rules governing AI are written in Brussels.[83] And it's a blunt instrument.

The AIA is a horizontal law that would apply to any product that uses AI. It sorts AI systems into three categories: prohibited, high-risk, and limited risk. Any system that could affect people's fundamental rights or safety is considered 'high-risk'. A broad swath of potential applications is included—from critical infrastructure to educational and vocational training—subjecting them to a battery of requirements before companies can bring them to market.

New rules on AI will inhibit rather than liberate European entrepreneurs & start-ups, and frustrate new tech ecosystems.

The Centre for Data Innovation issued a report on the impact of the AIA.[84] Using the Commission's impact assessment as a starting point, it calculates that these compliance burdens will cost European businesses €10.9 billion per year by 2025, adding up to €31 billion over the next five years. And, as the report points out, this excludes opportunity costs of foregone investment into AI, such as lower productivity growth and a likely brain drain as start-up innovators find it easier to set

The Brussels Effect

up shop elsewhere. It notes further that only about 7 per cent of non-financial businesses in Europe currently use AI. Yet the AI Act will designate more than one-third of the economy's non-financial sectors (by value) as 'high risk', making it more costly and complicated for those businesses to invest in AI. Indeed, a small business with an annual asset turnover of €10 million would face up to €400,000 in compliance costs for a high-risk AI product - about 40 per cent of its profits. Fines for non-compliance could rise to as high as €20 million or up to 40 per cent of total annual turnover.[85]

The impact will be fundamentally damaging to the EU's digital transformation. Not only will there be less inclination for investment in the EU AI sector - the report suggests that investment will fall by at least 20 per cent - but will clear the way for foreign competitors to take market share away from their European counterparts. Mark Minevich, president of Going Global Ventures, suggests that this initiative threatens to cripple AI development in the EU while China and the USA leap forward.[86] He notes that in the USA, AI is being optimized to maximize corporate profitability and efficiency, while in China, it is optimized to maximize the government's grip on the population with the preservation of power. In other words, it is being used to develop practical outcomes. In the EU, it is about regulatory capacities. The EU's aggressive regulations and lack of funding mean that the EU might win the global leadership in AI regulation, but it will drive many European entrepreneurs to launch their start-ups in more AI-friendly countries.

The impact of restrictions in the AI Act will be fundamentally damaging to the EU's digital transformation.

The AIA will not just let European entrepreneurs down. The precautionary, safety-first approach throttles any prospect of innovation. It is almost impossible to pre-define all the use cases for future AI-based products and services. AI is still a relatively young and fast-evolving technology. The massive EU bureaucracy threatens to undercut any entrepreneurship or bottom-up innovation efforts. Premature regulation is a real threat to its future. Indeed, the 'real' use cases of AI are yet to emerge.

It is interesting to note that the EU is aware of the danger of inhibiting innovation in this way. In July this year, it published its 'New European Innovation Agenda', which among its many topics, includes the provision of 'regulatory sandboxes', particularly in the public sector. These will provide well-defined exemptions to allow trials of innovative products and technologies that would otherwise not be fully compliant with existing regulations. There is a promise to produce a staff working document to provide an overview of the main existing restricted experimentation clauses and regulatory sandboxes in EU law. It offers support for innovators to identify areas and establish an experimentation space. To this end, the Commission intends to create a GovTech Incubator in 2023, which will provide an agreement for cross-border collaboration between digitalisation agencies for the deployment of innovative digital government solutions through the Digital Europe Programme.[87]

This bureaucratic approach views innovation as something that can be dictated from above – it cannot.

However, the prospects of this producing anything meaningful are very slim. The excessively bureaucratic approach views innovation as something that can be dictated from above, like turning on a switch. The real problem is that these sandboxes are not an attempt to get around the precautionary principle - they are an expression of it. They are framed within the existing legal limits, which suggest that whatever experimentation takes place, the problem they will be trying to solve is how to get around the limits the EU itself is setting rather than produce anything game-changing in the real world. What will the outcome be in the unlikely event of an experiment yielding promising outcomes? Will the EU reverse its legal restrictions? This might look good on paper, but it is a bureaucratic distraction from the reality that the EU stands to lose even more ground in the AI innovation race to the USA and China.

It cannot be stressed enough that the EU's precautionary culture is inimical to fostering an innovative Europe. The focus is on the here and now, and the driver is the felt need to control existing outcomes rather

than risk or disrupt what comes tomorrow. Once again, the unexpected outcome of the regulatory urge is to impact Europe's technological ambitions negatively. This is particularly the case with the Digital Markets Act (DMA), which came into law in November.

Regulating Competition at the Expense of European Technology Innovation

The Digital Markets Act (DMA) is the EU's biggest change to antitrust law in decades. Unfortunately, the law fundamentally misunderstands how competition in the digital marketplace works. It also applies flawed remedies to the detriment of the EU's technology sector and European consumers.[88]

It should be recalled that this was the area in which there was a widespread desire for 'something to be done' about Big Tech. The primary focus of the DMA seems to punish companies that are too big or just too American.[89] It sets out rules for how large online platforms—firms with a market capitalisation greater than €65 bn—can compete in the EU. The passage of this law does show how Big Tech has failed to curb the EU's regulatory impulses.[90] Instead, the EU is passing a law that gives regulators aggressive enforcement tools: violations can lead to fines of up to 20 per cent of global turnover, and regulators can compel repeat offenders to break up their businesses.

> ## The DMA will inhibit innovation as it penalizes the incentive to innovate.

The ITIF describe the DMA as a 'European Precautionary Antitrust' law,[91] which among many things, reverses the burden of proof of harm.[92] The belief at the core of the Bill is that it is no longer necessary for regulators to justify their interventions: the market participants must justify not needing regulators to intervene. The DMA organizes digital markets on the assumption that these markets are largely static. The stated aim of increasing consumer choice is an unsubtle cover for the fact that the EU aims to increase producer diversity by enabling European gatekeepers to supplant foreign ones.[93]

The law imposes an ambition onto reality rather than dealing with reality. It assumes

that competition is most likely to emanate from services that are perfect substitutes for today's incumbents. The DMA focuses on the competition between Google and start-ups, as stated above, to try to ensure European companies can build competitive alternatives to existing products or services. So, the DMA will not allow Apple to leverage its digital infrastructure (the personal data from its App store) to feed and improve its search function in its bid to compete with Google. The DMA ends up creating legal barriers which protect Google's position in online search from other competitors. The same goes, in fact, for all the tech giants' core digital services. It does not mean that none of these giants' positions will ever be challenged, but the DMA is effectively making competition between them more difficult and thus entrenching their monopolistic dominance. In that regard, the DMA does not promote market dynamism; it preserves market positions as they exist and simply reorganises the distribution of outcomes.

Moreover, the DMA assumes that the structure of markets today will remain the same in years to come. The launch of OpenAI's ChatGPT, the machine-learning AI natural language processor is a very good example of how technology never stands still.[94] Although it is rudimentary and has a long way to go, it is clearly the start of a fundamental challenge to search as we know it. The future of search is not going to be dominated by the Googles of this world, at least not in their present form. For all their rhetoric about wanting disruptive innovation, the EU is wedded to an outlook that is stuck in the ever-present.

The DMA is an important piece of legislation not only because it represents a violation of a fundamental legal principle. For our purposes, it is critical because its effect is going to inhibit innovation as it threatens to penalise the incentive to innovate. This law, as well as the many others that make up the EU's digital strategy, show how the EU is preoccupied with leveraging its digital sovereignty at the expense of developing its own technological capabilities. The implications of this for the future will be dealt with in the concluding section below.

IV CONCLUSION

THE FUTURE BELONGS TO THOSE WHO SHAPE IT …

NOT THOSE WHO REGULATE IT

Shape it, Don't Regulate it

The challenge facing the EU and its digital future comes down to one fundamental question: can the EU remain content to be at the forefront of regulating digital technologies without developing them itself?

The EU's assertion of its digital sovereignty through its regulatory power is a massive gamble for five reasons:

1. **Europe is acting from a position of weakness:** It is betting that it can corral the technology giants and unleash a new wave of European innovation, which is by no means a guaranteed outcome.

2. **Big Tech platforms are not impotent or passive bystanders:** We saw in the cloud computing, data storage and portability sphere how Big Tech is changing tack to conform with EU regulations ensuring their continued dominance in Europe.

3. **The 'Brussels Effect' is not exclusive:** wielding regulatory power is also becoming a force in the USA and China, where digital sovereignty is backed by technological sovereignty and thus has the potential to impact global digital markets very directly.[95]

4. **Redistributing outcomes is not the equivalent of creating them:** By assuming that what exists today is what will determine outcomes tomorrow, the EU is stuck in the present. Without the capacity to determine future outcomes, the EU will always be playing catch up. Every reaction carries the inherent danger of becoming a barrier to developing new innovations.

5. **The 'Brussels effect' distracts the EU from urgently addressing Europe's start-up gap:** the EU's precautionary, risk-averse mentality acts as a structural barrier to overcoming the damaging barriers it has placed on developing a start-up ecosystem. Start-ups are a fundamental part of developing the EU's technological, not digital, sovereignty and thus its future ability to digital self-determination.

Of course, it is impossible to predict any of these outcomes, particularly concerning start-ups and innovation. But the uncomfortable truth for the EU is not only that they are losing the technology innovation battle, but they are simultaneously squandering the potential to fight back.

Regulatory innovation will always produce unexpected outcomes in the future. Regulation is, by its very nature, *post-festum*. Regulators are always playing catch-up. In focusing only on the sphere of the known, barriers are erected that can raise costs, as we have already seen above, and can inhibit real experimentation that could turn out to be game-changing. The assumption about Big Data and the need for huge data sets for future AI innovation - an assumption that informs the EU's Data Act - are proving wrong, for example. The more sophisticated algorithms being developed today require less data. AI can now learn on much smaller datasets than previously imagined.[96] This has important implications for the future of AI innovation, data storage and portability which the EU's regulatory zeal aims to freeze in time.

We have seen from the above how critical the future of AI will be and, most importantly, what role AI start-ups will play in this. Europe's start-up gap is an area of urgent focus.

Overcoming the Barriers to Innovation: a start

For Europe to compete for the digital future, the EU needs to review all areas of its precautionary legal frameworks that inhibit entrepreneurship and innovatory risk-taking. Box IV summarises the key actions that must be urgently undertaken.

The area of harmonising national tax regimes to enable start-ups to offer equity to attract and retain critical talent is one such area that needs urgent and immediate focus. But more broadly, the EU should immediately set up a start-up task force to review every dimension of creating a robust start-up ecosystem. The focus of such a task force would be to recommend changes across the board that would encourage experimentation to enable genuine bottom-up disruptive technologies to emerge. This review should include a serious examination of the role of education, training and skills, especially the current focus on bland, content-light 'business' or 'innovation' studies (students need serious 'hard' skills).

The EU should also undertake a strategic review of member states' initiatives and give priority and backing to ones that could improve Europe's technological base. The example mentioned above of Hungary's investment in lithium battery production is such an initiative with huge potential for the future.

Shape it, Don't Regulate it

In addition, the EU should dismantle its present dysfunctional decentralised cross-Commission innovation responsibilities and place this under the control of one Innovation and Start-up Commissioner - preferably someone who has hands-on experience with start-ups, is ambitious and who possesses entrepreneurship zeal.

But we also need more than this. We all have a responsibility – and in the current context, a duty – to create a genuinely risk-taking culture. This is not simply a job for the 'EU machine', nor simply a question of the right technical reforms. From schooling to regulation, culture to industry, and in political culture more broadly, there is a serious lack of appetite for risk. Risk, across society, is demonised: New technology is routinely dismissed as dangerous; young people are socialised into a culture of safetyism; and politicians offer only lowered horizons and varieties of austerity. Reclaiming a confident, risk-taking and open-minded culture should be the priority across Europe; its fruit would be more than a culture of innovation, but a contribution to the renewal of Europe as such.

We all have a responsibility – and in the current context, a duty – to create a genuinely risk-taking culture.

These task are urgent and doable if there is the political will and ambition to go for it. Europe has more software engineers than the USA or China. It boasts some of the best university and research institutions in the world. It has significant quantum computing experience. It also has a long history of scientific and technological breakthroughs, like the development of mobile telephony. It has the wealth for investment that would transform many promising start-ups into tomorrow's unicorns. None of this has so far been transformed into a European technological edge. The fact that many European entrepreneurs find it necessary to leave the EU to realise their ambitions is an indictment of the EU and its risk-averse regulatory mindset. This brain and entrepreneurship drain represents a real threat to the future.

Start-ups not just in digital technologies but energy, networking infrastructure and rare metals recycling are potential routes through which new scientific breakthroughs and inventions can be transformed into the products and services that serve society. Regulating outcomes protects existing consumer choices. But it's tomorrow's products and services that are the source of future wealth creation. Redistributing existing outcomes on the assumption that European consumers would be better served by European tech companies rather than American or Chinese ones shows contempt for European citizens and the EU's low expectations about the future. Above all, it exposes the lack of ambition at the heart of the Brussels machine.

Reclaiming a confident, risk-taking and open-minded culture should be the priority across Europe.

This will cost Europe dearly. If the EU's regulatory impulses continue to dominate its outlook and continues to believe the assertion of its digital sovereignty will suffice, then all this effort will only result in the acceleration of its geopolitical decline.

The EU will not become a pioneer but remain a laggard. It will not be a player but a referee: Europe will not participate as an equal in the digital geopolitical order - it will remain what it is now - a geopolitical battleground. Referees do not win football matches. The future does not belong to the defensive safety-first regulators of what exists. It belongs to those who are willing to take risks and create it.

BOX IV

OVERCOMING THE BARRIERS TO INNOVATION: A START

European leaders must urgently consider the following actions:

1. Articulate and reclaim a confident and positive culture of risk-taking and innovation

2. Stop the demonisation of technological progress

3. Harmonise national tax regimes to allow start-ups to offer equity rewards to staff

4. Reform pension and endowment regulation to allow more investment in start-ups

5. Explore renewed investment incentives in companies and R&D

6. End the precautionary legal framework underpinning digital regulations

7. Roll back over-protective regulations on AI

8. Improve education, from Universities through to apprenticeship schemes, with a focus on content-rich education

9. Launch a strategic review at the EU level of member-state initiatives to promote start-ups, supporting those which expand the industrial/technological base

10. Appoint a single Innovation and Start-up EU Commissioner

About

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Dr Norman Lewis is a writer, speaker and consultant on innovation and technology. He is recognised worldwide as an expert on future trends and user behaviours regarding technology innovation and adoption. He has many years of experience working with start-ups in Silicon Valley and the UK. Norman was formerly a director at PwC, responsible for running their crowd-sourced innovation programme. Before this, he was the director of technology research at Orange, France Telecom. He is an advisory board member of Bubbletone Blockchain in Telecom – the world's first decentralised mobile roaming service. He was also an executive board member of the MIT Communications Futures Programme and a former ITU TELECOM Forum programme committee chairman. He is a co-author of Big Potatoes: the London manifesto for innovation.

About MCC Brussels

At a time of unprecedented political polarisation, MCC Brussels is committed to providing a home for genuine policy deliberation and an in-depth exploration of the issues of our time. It will provide an opportunity for intellectuals and experts to debate and assess the conceptual and normative status of European policy making. Drawing on MCC's outstanding pool of expertise it will attempt to acquaint and influence European policy makers with its distinct approach towards the political, socio-economic and cultural issues of our time. The centre will offer a challenging and stimulating environment for visiting young students to acquaint themselves with the policy and decision-making process in Brussels. It will provide short educational courses and seminars on matters pertaining to European thought and EU policy making.

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Notes

1. https://www.gartner.com/en/documents/4011974
2. https://www.statista.com/statistics/871513/worldwide-data-created/
3. Although this jump is significant, the number of bills related to AI being passed has not kept pace with the growing volume of proposed AI-related bills. This gap was most evident in 2021 when only 2% of all federal-level AI-related bills were ultimately passed into law. (See https://hai.stanford.edu/research/ai-index-2022)
4. https://www.ft.com/content/bdcbbdf3-24dd-436d-9e0f-36db2348eadd. For the reaction see: https://www.ft.com/content/45c0c4c3-b578-4aac-8aed-ea4267633834
5. https://www.datacenterknowledge.com/archives/2015/07/21/russian-data-localization-law-spurs-data-center-strategy-changes
6. https://ec.europa.eu/info/sites/default/files/communication-shaping-europes-digital-future-feb2020_en_4.pdf
7. See https://ec.europa.eu/commission/presscorner/detail/en/ip_20_273
8. See 'QUESTIONNAIRE TO THE COMMISSIONER-DESIGNATE Thierry BRETON Commissioner-designate for the Internal Market': https://ec.europa.eu/commission/commissioners/sites/default/files/commissioner_ep_hearings/answers-ep-questionnaire-breton.pdf
9. See https://ec.europa.eu/commission/commissioners/2019-2024/breton/announcements/europe-keys-sovereignty_en
10. See https://policyreview.info/articles/analysis/safeguarding-european-values-digital-sovereignty-analysis-statements-and-policies
11. See this important study by Dradford, A (2020), *The Brussels Effect: How the European Union Rules the World,* Oxford University Press, London.
12. These are SAP and ASML. See https://companiesmarketcap.com/tech/largest-tech-companies-by-market-cap/
13. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1962
14. See the EU's 'New Innovation Agenda' published this year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022DC0332
15. Arkko, Jari. Distribution of RFCs According to the Countries of Their Authors, 7 June 2022, https://www .arkko.com/tools/recrfcstats/d-countrydistr.html.
16. See https://ec.europa.eu/docsroom/documents/48598
17. See, Baron, J, (2021) 'Global Competition for Leadership Positions in Standards Development Organizations', SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3818143
18. This is the point alluded to by Dr Magnus Frodigh, vice president and head of Ericsson research makes in an article 'Europe's future needs driven inventors', *Politico*, 28 November 2022: https://www.politico.eu/sponsored-content/europes-future-needs-driven-inventors/
19. https://www.wsj.com/articles/SB10001424052702304173704579262361885883936?mod=article_inline
20. https://www.atlanticcouncil.org/in-depth-research-reports/report/cyber-defense-across-the-ocean-floor-the-geopolitics-of-submarine-cable-security/
21. https://www.wsj.com/articles/google-amazon-meta-and-microsoft-weave-a-fiber-optic-web-of-power-11642222824
22. https://www.wsj.com/articles/google-amazon-meta-and-microsoft-weave-a-fiber-optic-web-of-power-11642222824
23. https://www2.telegeography.com/hubfs/assets/Ebooks/state-of-the-network-2021.pdf
24. https://www.wsj.com/articles/SB10001424052702304173704579262361885883936?mod=article_inline
25. For example, The Marea cable, which stretches approximately 4,100 miles between Virginia Beach in the U.S. and Bilbao, Spain, was completed in 2017 and is partly owned by Microsoft, Meta and Telxius, a subsidiary of Telefónica, the Spanish telecom. https://www.wsj.com/articles/facebook-and-microsoft-to-build-fiber-optic-cable-across-atlantic-1464298853?mod=article_inline
26. Reserving some capacity for telecom carriers like Telxius is also a way to keep regulators from getting the idea that these American tech companies are themselves telecoms. Tech companies have spent decades arguing in the press and in court that they are not 'common carriers' like telcos—if they were, it would expose them to thousands of pages of regulations particular to that status.

27. https://www.wsj.com/articles/google-plans-fiber-optic-network-to-connect-via-saudi-arabia-and-israel-for-first-time-11606143590?mod=article_inline

28. https://siliconangle.com/2010/03/29/inside-ten-of-the-worlds-largest-data-centres/

29. https://webtribunal.net/blog/data-center-statistics/#gref

30. https://www.ft.com/content/37e8c5fc-2af3-4343-bfb8-13f34e292392

31. https://www.statista.com/chart/18819/worldwide-market-share-of-leading-cloud-infrastructure-service-providers/

32. https://blog.telegeography.com/where-are-the-worlds-cloud-data-centres-and-who-is-using-them

33. https://www.statista.com/statistics/1228433/data-centres-worldwide-by-country/

34. https://www.ft.com/content/05a17586-5b08-4f2f-a228-f2c757c824b9

35. https://www.politico.eu/sponsored-content/cloud-computing-is-key-for-europe-while-enabling-data-sovereignty/

36. https://d1.awsstatic.com/whitepapers/Whitepaper_Overcoming_the_Tension_Between_Data_Sovereignty_and_Accelerated_Digital_Transformation_2022.pdf?trk=560492a0-5020-4e81-b3a3-2bed604d1611&sc_channel=displayads&dclid=CJKDypvixvsCFZIRBgAdxpgBvg

37. https://www.ft.com/content/fe968bbb-c15d-455f-964c-9aeeef9db5f1

38. A surprisingly helpful overview can be found on Wikipedia https://en.wikipedia.org/wiki/GAIA-X

39. https://www.politico.eu/article/chaos-and-infighting-are-killing-europes-grand-cloud-project/

40. https://www.bmwk.de/Redaktion/EN/Pressemitteilungen/2021/07/20210709-cloud-ipcei-entering-next-phase.html

41. https://www.euclidia.eu/background/

42. See the IDC Whitepaper, 'Overcoming the tensions between Data Sovereignty and accelerated digital transformation',https://d1.awsstatic.com/whitepapers/Whitepaper_Overcoming_the_Tension_Between_Data_Sovereignty_and_Accelerated_Digital_Transformation_2022.pdf?trk=560492a0-5020-4e81-b3a3-2bed604d1611&sc_channel=displayads&dclid=CMy4tomxt_sCFVlHHQkd-U8KOg

43. The ITIF are the world's leading think tank for science and technology policy:https://itif.org/about/

44. https://datainnovation.org/2021/04/is-the-eu-doing-enough-to-address-europes-digital-investment-shortfall/

45. See https://assets.ctfassets.net/fzn2n1nzq965/as5AW9rw46xEysdTl9Ie8/19b71550059812fcbe2a78b2c2b438f7/Stripe-European_Tech_Voices.pdf

46. https://news.crunchbase.com/venture/ai-companies-raise-more-money-across-fewer-rounds/

47. https://www.cbinsights.com/research/report/artificial-intelligence-top-startups-2022/

48. https://itif.org/publications/2021/01/25/who-winning-ai-race-china-eu-or-united-states-2021-update/

49. See: https://aiindex.stanford.edu/wp-content/uploads/2021/11/2021-AI-Index-Report_Master.pdf

50. https://multimedia.europarl.europa.eu/en/webstreaming/special-committee-on-artificial-intelligence-in-digital-age_20210323-0900-COMMITTEE-AIDA

51. Bremmer, Foreign Affairs.

52. https://www.weforum.org/agenda/2022/09/how-much-eu-countries-spend-r-d-budget/

53. https://www.nasdaq.com/articles/which-companies-spend-the-most-in-research-and-development-rd-2021-06-21

54. https://www.nasdaq.com/articles/which-companies-spend-the-most-in-research-and-development-rd-2021-06-21

55. https://www.investopedia.com/insights/worlds-top-economies/

56. https://www.ft.com/content/f92123b2-8702-11e3-aa31-00144feab7de

57. https://datainnovation.org/2019/08/who-is-winning-the-ai-race-china-the-eu-or-the-united-states/

58. See, for example, the Commission's paper outlining their 'Coordinated Plan on Artificial Intelligence': https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0795&rid=3

59. Exploring what exactly 'ethical AI' means is beyond the scope of this paper. But it clearly an area that requires future research and precision.
60. See Carla Hobbs, 'Europe's digital sovereignty: from rule makers to superpower in the age of US-China rivalries', European Council on Foreign Relations, July 2020: https://ecfr.eu/publication/europe_digital_sovereignty_rulemaker_superpower_age_us_china_rivalry/
61. https://files.pitchbook.com/website/files/pdf/2020_Annual_European_Venture_Report.pdf
62. See https://news.crunchbase.com/venture/north-america-venture-investing-2020-report/#exits
63. See, 'Study on Equity Investment in Europe: Mind the gap', EU Commission's Directorate-General for Research and Innovation, 2021, https://op.europa.eu/en/publication-detail/-/publication/4a355d87-669a-11eb-aeb5-01aa75ed71a1/language-en/format-PDF/source-189790753
64. https://www.forbes.com/sites/markminevich/2021/01/18/how-the-eu-is-leading-the-way-in-ai-powered-social-innovation/?sh=6e97b5e56bb7
65. https://files.pitchbook.com/website/files/pdf/Q4_2020_PitchBook_NVCA_Venture_Monitor.pdf
66. https://news.crunchbase.com/startups/european-vc-report-2020-strong-fourth-quarter-closes-out-2020/
67. https://www.politico.eu/newsletter/digital-bridge/politico-digital-bridge-amazon-workers-gaming-woes-duckduckgo-ceo/
68. For example, see https://www.eu-startups.com/2017/10/10-european-founders-who-conquered-the-us-with-their-startup-and-succeeded-big-time/
69. https://www.eu-startups.com/2021/07/french-startups-that-have-a-us-presence-raise-2-3x-more-capital-interview-with-olivier-huez-partner-at-vc-firm-red-river-west/
70. https://techcrunch.com/2021/05/15/european-ai-needs-strategic-leadership-not-overregulation/
71. See 'European Tech Voices', July 2022: https://assets.ctfassets.net/fzn2n1nzq965/6MvKDl0vH0Agay2MuEZ72x/e80f8d835dc93c6c039a60b2a3d9a497/European_Tech_Voices_-_Stripe.pdf
72. https://www.euractiv.com/section/digital/news/new-innovation-agenda-launched-to-boost-eu-startup-ecosystem/
73. https://eic.ec.europa.eu/eic-work-programme-2022_en#:~:text=The%20European%20Commission%20adopted%20the,up%20and%20create%20new%20markets.
74. https://www.euractiv.com/section/digital/news/european-investment-council-heavily-criticised-in-parliament-report/
75. https://sciencebusiness.net/news/parliament-investigate-issues-plaguing-european-innovation-council
76. https://www.politico.eu/article/eu-startups-have-a-question-for-brussels-whos-in-charge/
77. This issue should not be underestimated: according to a Deloitte Report, 'The progress towards the EU's Digital Decade ambition', 25 March 2022, the number of ICT specialists across the EU27 as a whole currently stands at 8.43 million. But the number needs to more than double by 2030 in order to hit the 20 million target. https://www.vodafone.com/sites/default/files/2022-03/progress-towards-eu-digital-decade-ambition.pdf
78. See https://gdpr.eu/
79. See Powles J. 'The G.D.P.R., Europe's New Privacy Law, and the Future of the Global Data Economy', The New Yorker, 2018. https://www.newyorker.com/tech/annals-of-technology/the-gdpr-europes-new-privacy-law-and-the-future-of-the-global-data-economy
80. See this important study by Dradford, A (2020), *The Brussels Effect: How the European Union Rules the World,* Oxford University Press, London.
81. A discussion of the precautionary principle and the EU is beyond the scope of this report, but it is an important backdrop because it influences the Commission across the board. See for example, European Commission. (2000). Communication from the Commission on the precautionary principle. COM (2000) 1, European Commission White Paper. Brussels: EC.
82. https://artificialintelligenceact.eu/ A more detailed analysis of this is necessary but this is beyond the scope of this report.
83. https://www.brookings.edu/blog/techtank/2021/05/04/machines-learn-that-brussels-writes-the-rules-the-eus-new-ai-regulation/

Notes

84. https://datainnovation.org/2021/07/how-much-will-the-artificial-intelligence-act-cost-europe/
85. https://www.jdsupra.com/legalnews/draft-eu-regulation-for-artificial-7284484/
86. 'European AI needs strategic leadership, not overregulation', TechCrunch, 15 May 2021: https://techcrunch.com/2021/05/15/european-ai-needs-strategic-leadership-not-overregulation/
87. See pages 8-9, 'A New European Innovation Agenda': https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0332
88. https://www.csis.org/analysis/european-unions-digital-markets-act-primer
89. https://datainnovation.org/2022/06/misconceptions-about-digital-competition-and-innovation-are-causing-substantial-damage-to-the-eus-digital-economy/
90. https://www.ft.com/content/cbb1fe40-860d-4013-bfcf-b75ee6e30206
91. https://itif.org/publications/2021/05/24/digital-markets-act-european-precautionary-antitrust/
92. See, for a general discussion about the reversed burden of proof, Cass Sunstein, "Beyond the Precautionary Principle," *University of Pennsylvania Law Review*, 151 (2003), 1004–5, https://www.jstor.org/stable/3312884.
93. https://www.networklawreview.org/digital-markets-act-is-conservative/
94. https://openai.com/
95. In the US, lawmakers in New York, California, and elsewhere are working on regulation for the use of AI in high-risk sectors such as employment. (See https://news.bloomberglaw.com/daily-labor-report/new-york-city-ai-bias-law-charts-new-territory-for-employers and https://www.theregister.com/2022/04/07/california_ai_hiring/). In early October, the White House unveiled the AI Bill of Rights, which lays out five rights Americans should have when it comes to automated systems. The bill is likely to spur federal agencies to increase their scrutiny of AI systems and companies. (See https://www.technologyreview.com/2022/10/04/1060600/white-house-ai-bill-of-rights/)
96. This was a point already being made by Eric Schmidt, former CEO and Executive Chairman of Google in 2019: See the 2019 conference on AI Ethics, Policy & Governance, held by the Stanford Institute for Human-Centered Artificial Intelligence. https://hai.stanford.edu/news/stewarding-ai-age-big-tech)